

AUTEC

Atlantic Undersea Test and Evaluation Center



...The Atlantic's most versatile in-water range

2002 ANNUAL REPORT

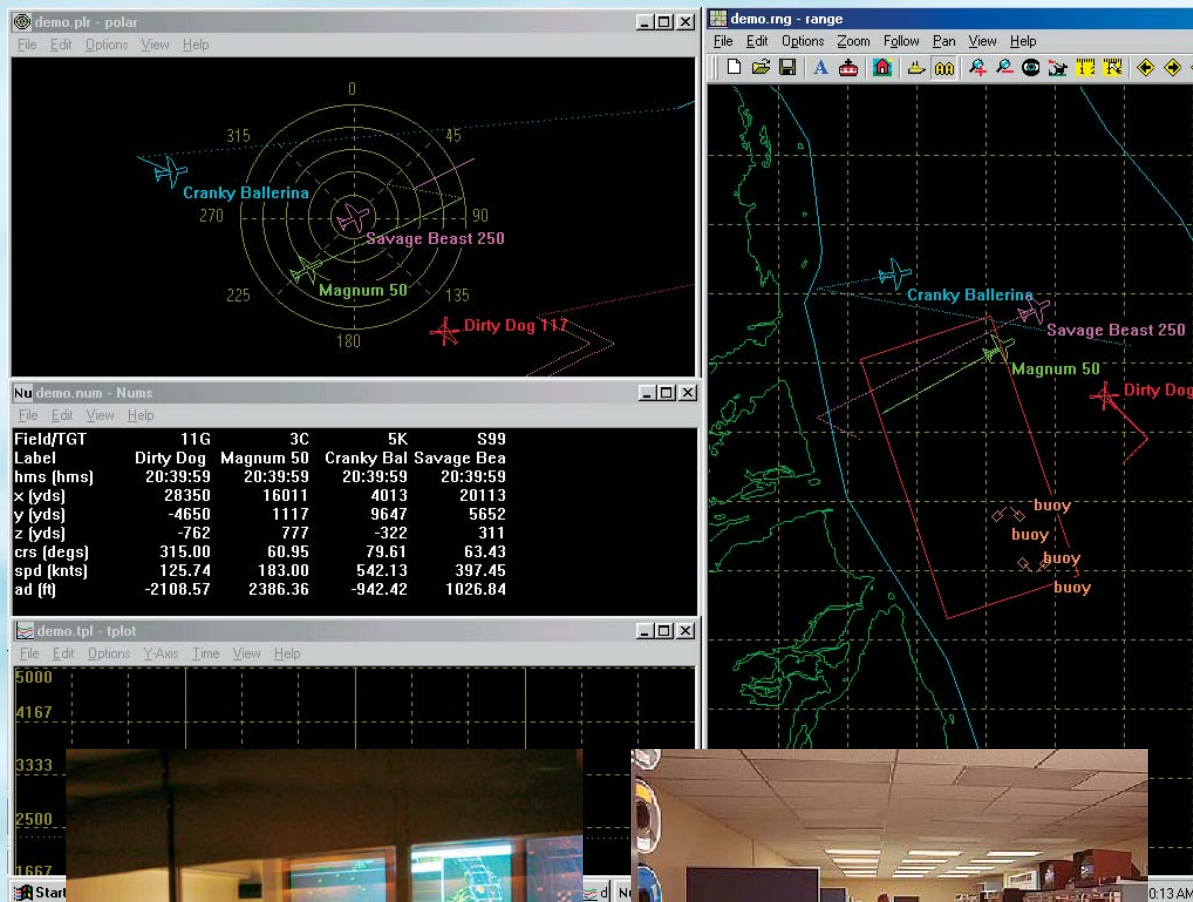


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Who We Are...The Atlantic Undersea Test and Evaluation Center (AUTC) is...

...a Major Range and Test Facility Base (MRTFB) and the Naval Undersea Warfare Center Division Newport's (NUWCDIVNPT's) largest single team project, providing both deep and shallow water test and training environments.

In the Tongue of the Ocean (TOTO), AUTC operates a contiguous, 500-square-nautical-mile (nmi²) instrumented range located in a deep-water basin, 110 by 20 nmi with depths ranging from 1,300 meters to 2,000 meters off Andros Island in the Bahamas. This basin is bounded on three sides by un-navigable or lightly navigated ocean areas, making the basin an excellent, isolated ocean test area. Access to the AUTC range is geographically restricted by its remote nature, is secure from most commercial and private encroachment, providing unmatched operational security. This same topography provides a unique, acoustically sheltered environment with water-borne noise levels that are typically below Sea State 1 and ideally suit the needs of the U.S. Navy's radiated noise measurement program.

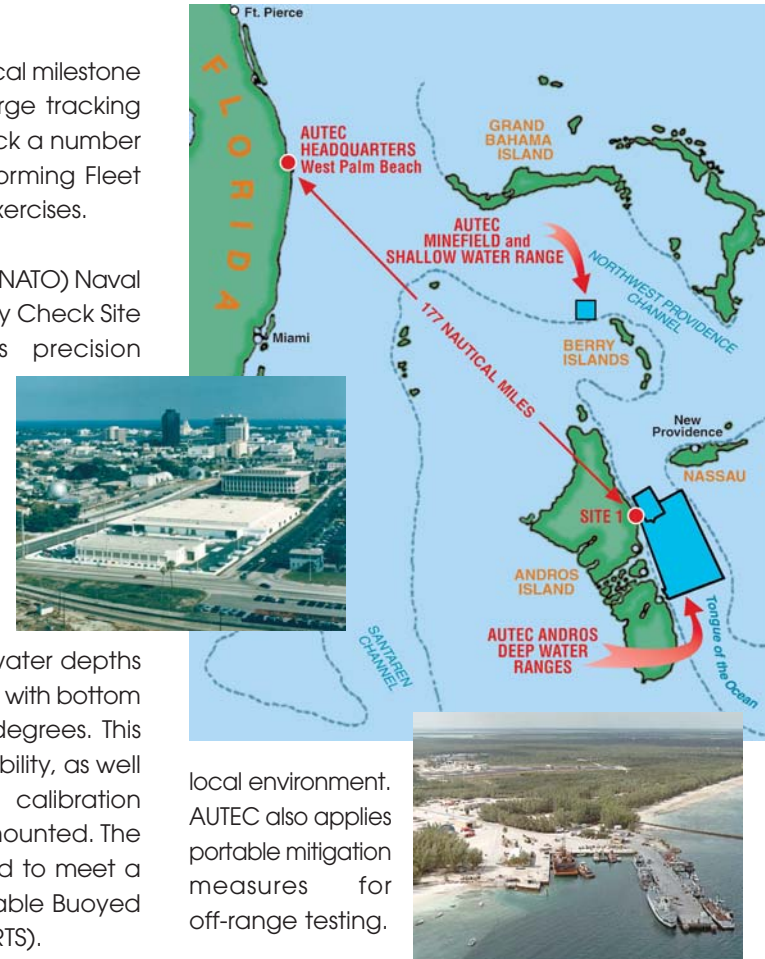
AUTC provides range operations support for both the U.S. and Allied Navies' Research Development, Test, and Evaluation (RDT&E) communities and Fleet commands. AUTC's high-precision three-dimensional (3-D) tracking systems, both in-air and in-water, enable system acquisition program managers to

gather requisite data for assessing critical milestone performance measures, while the large tracking area and ability to simultaneously track a number of individual objects is ideal for performing Fleet training and tactical development exercises.

The North Atlantic Treaty Organization (NATO) Naval Forces Sensor and Weapons Accuracy Check Site (FORACS) AUTC (NFA) performs precision measurements for the accuracy of target, surveillance, and navigation sensors installed on surface ships, submarines, and helicopters.

AUTC's Shallow-Water Test Complex (in-air and in-water tracking) off the Berry Islands is 68 nmi² of underwater tracking adjacent to a minefield at water depths from 25 meters to over 700 meters, and with bottom slope variable between 1.5 and 15 degrees. This test site has a fixed 3-D tracking capability, as well as a minefield that includes sonar calibration spheres, both tethered and bottom-mounted. The in-water tracking area can be tailored to meet a customer's requirements using a portable Buoyed Acoustic Range Tracking System (BARTS).

The range received environmental approval from the Chief of Naval Operations (CNO) in 1997 and has mitigation measures in place that effectively afford protection to both marine mammals and the



local environment. AUTC also applies portable mitigation measures for off-range testing.

Details of AUTC's capabilities and facilities can be found at AUTC's website: <http://www.npt.nuwc.navy.mil/autec>.

Economic Impact

AUTEC has three principal sites:

- Headquarters are located at NUWCDIVNPT, Newport, Rhode Island.
- Engineering and administrative offices are located at West Palm Beach, Florida.
- Range and test operations are located at Andros Island, Bahamas.

AUTEC's impact on the Northeast and Southeast U.S. economies was \$44.1 million (M) for fiscal year 2002 with an additional \$19.1M on the Bahamian economy; for a combined economic impact of \$63.2M.

The U.S. economic impact is comprised of the Division's payroll, other agency and other direct expenditures. AUTEC's payroll compensates a workforce with \$25.3M for U.S. military, civil service, and contractor personnel. Direct expenditures include purchase contracts with local vendors for perishables, water, and fuel; equipment/materials; equipment service, financial, and administrative support; as well as airport facility and port fees to Palm Beach County. These expenditures create jobs within the secondary market and local infrastructure, but have not been quantified. (Not included in these numbers are military and contractor health insurance paid to local hospitals and doctors, utility costs, or secondary market impact from visitors' discretionary spending.)

AUTEC's combined U.S./Bahamian employment impact is distributed from Rhode Island to Florida and through international boundaries to the Bahamas. Included within the \$25.3M payroll, is \$15.7M for Raytheon Maintenance and Operations contracting. AUTEC also supports surrounding communities by contracting \$4.9M for financial, administrative, and technology enhancement services.

AUTEC's economic impact on the Bahamian economy was \$19.1M for fiscal year 2002. This figure includes \$2.8M payroll for Bahamian citizens and \$3.8M for local purchases including petroleum, Bahamian charities, and vehicle registration. The largest portion of the amount, almost \$10.7M, is for the lease of property used by AUTEC.

Fiscal 2002: U.S. Economic Impact

<u>Employment</u>	<u>Dollars</u>
Total Direct	\$4,710,000
Military	1,150,000
Government Civilian	3,430,000
Other Government Agencies	130,000
Total Contractor	\$20,610,000
Contractors (various suppliers)	4,910,000
Range Systems Engineering	15,700,000
Total U.S. Employment Impact	\$25,320,000
Other Direct Expenditures	\$18,810,000
	\$44,130,000

Fiscal 2002: Bahamian Economic Impact

<u>Employment</u>	<u>Dollars</u>
Total Payroll	\$2,820,000
Bahamian Civilian	2,820,000
Total Payments	\$16,300,000
U.S. Employee Expenditures	80,000
Local Purchases	3,880,000
Import Values	1,670,000
Bahamian Rent	10,670,000
Total Bahamian Economic Impact	\$19,120,000



Partnering

Mission Objective

"We...U.S. Navy Team AUTC and Raytheon Range Systems Engineering (RSE) Company...are committed to a positive utilization of a partnering approach to most effectively accomplish the requirements of our contract..." through "...a new organizational structure, based on the principles of empowerment, communications, and teamwork..."

2002 Review

Partnering: Naval Undersea Warfare Center (NUWC), Detachment AUTC and Raytheon

Our primary operating principle, adapted from the Arnold Engineering Development Center's corporate process model, is relevance and affordability through contractor-government partnership.

AUTC, Other Government Agencies, and Academia

Cooperative relationships among government agencies ensures we fully understand requirements and provide the best range capabilities possible to test new technologies and to train our warfighters.

AUTC has collaborated with Naval surface Warfare Center (NSWC) in a joint study on the feasibility of installing and operating a fixed in-water array in the South TOTO area. Acoustic

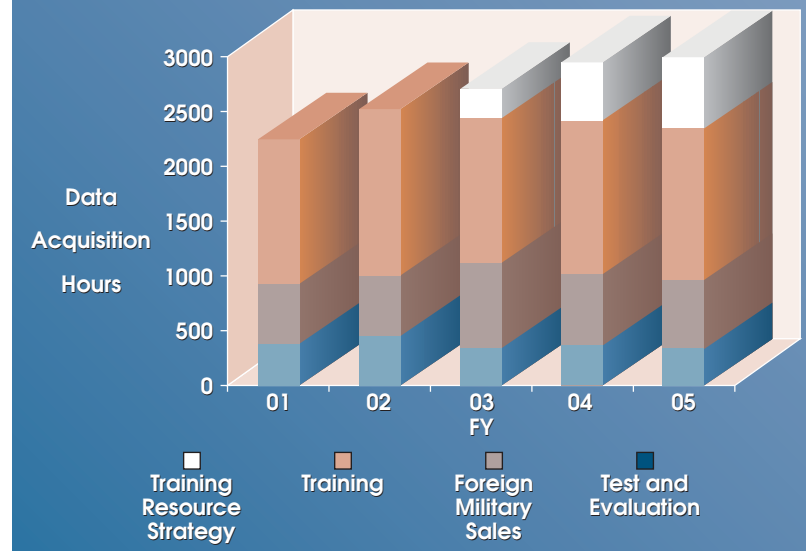
measurement of radiated noise from this site could provide the Navy time savings to conduct measurements while at AUTC for other events, and would allow an upgrade to an aging Navy capability. This study is ongoing.

During the year, AUTC participated in the U.S. Atlantic Fleet Joint Training Resource Strategy (TRS) initiative. The goal of TRS is to deploy combat-ready forces by using existing ranges for T&E and training. AUTC's selection by the TRS team will result in a significant increase in AUTC workload.

Partnerships with academia provide opportunities for AUTC to keep abreast of undersea technology developments, to foster environmental studies, and to promote awareness of local resources.

AUTC Base Operations and the University of Miami, Rosentiel School of Marine and Atmospheric Science to the Strategic Environmental Research and Development Program (SERDP) have collaborated on a proposal to integrate undersea technology and develop methodologies for evaluating and documenting the health and

TRS Change in Customer Workload



conditions of coral reef ecosystems in and around Department of Defense installations.

In June 2002, AUTC began sponsorship of an intern position to inventory plants and animals living on Andros Island through Naval Facilities Engineering Command (NAVFAC's) Student Conservation Association (SCA) program. Some rare species of plant and animal life such as the West Indian Whistling Duck and the American Kestrel, were sighted and photographed.

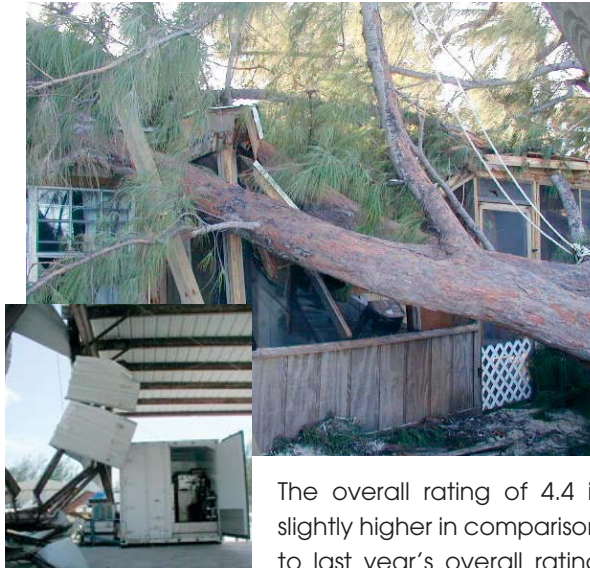
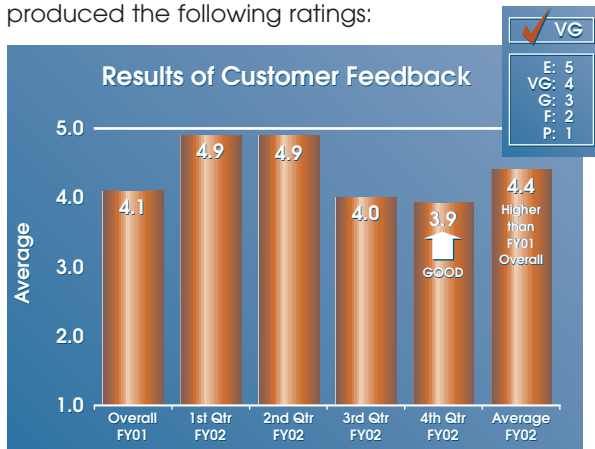
Strategic Goal: Progress

We are taking an incremental approach to improve the current partnering structure and achieve the AUTC Enterprise Team strategic goals and objectives established in 2000. Some of the major successes highlighted below will keep our facility affordable as well as versatile while continuing to achieve customer satisfaction goals.

To contain costs, AUTC Improvement and Modernization projects became ISO 9001:2000 certified this year.

Goal 1: Increase Customer Satisfaction ⇒ Exceed Customer Expectations

To monitor satisfaction, we continue to use a customer feedback process. The year-end assessment of key products and services responses to the AUTC Enterprise Team external customer questionnaire produced the following ratings:



The overall rating of 4.4 is slightly higher in comparison to last year's overall rating of 4.2 and shows continuous satisfaction and quality of services. For survey information, visit our website <http://www.npt.nuwc.navy.mil/autec>, e-mail Halpen-Lloyd@wpb.nuwc.navy.mil, or call 561-832-8566 x7326.

Early in the fiscal year, a Category 2 storm, Hurricane Michelle struck AUTC. The hurricane downed trees, damaged roofs, and left extensive water damage. Thanks to the remarkable dedication and commitment of Team AUTC, range and support services were restored in two days to support a scheduled submarine proficiency exercise. Range re-certification was achieved within two weeks.

Goal 2: Improve Cost of Ownership ⇒ Remain Affordable

As part of the Power Plant overhaul effort, six new, fully automated generators went on-line to improve energy efficiency. The replacement, 5.2 MW, continuous-duty generators were designed, constructed, and installed by Florida Power and Light using a General Services Administration (GSA) contract.



Our teams' successful grass-roots initiatives continue to result in significant cost savings, for example, expanding applications for a paperless office, internal training substituting for external training; and providing digital photographs in lieu of prints.

Goal 3: Increase Customer Base ⇒ Diversify Services

Several significant improvements were made in 2002 to replace antiquated equipment with innovative technology.

Through the combined efforts of several teams, the AUTECH Hydrophone Replacement Program (AHRP) officially went on-line in May. AHRP is an underwater tracking range upgrade that provides 68 new hydrophones, 16 of which are bi-directional, and integration of 25 existing hydrophones into the AHRP Shore Electronics System. AHRP integrates several tracking areas into one contiguous area and provides full underwater communications via bi-directional nodes, allowing free-play exercises.

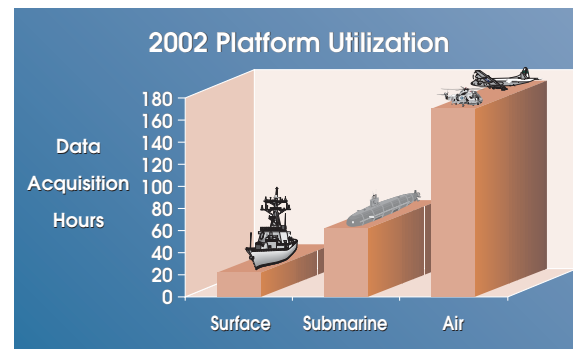
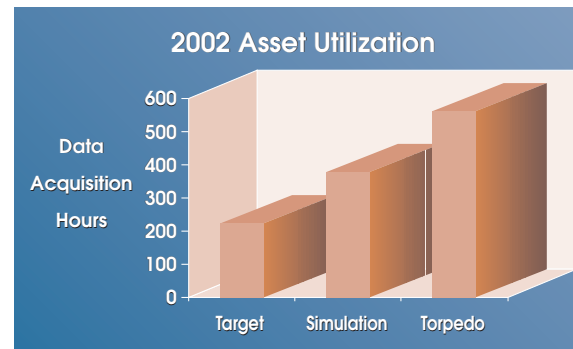
A new AUTECH range capability was introduced with the successful installation of the Electronic Support Measures (ESM) threat simulator system. This electronic warfare radar signal simulation system provides a dynamic and complex real-time electromagnetic

signal environment as part of the AUTECH open air and instrumented underwater test range. Scenario simulation is fully dynamic,



including range-based emitter mode transitions. The ESM electronic warfare simulation capability is fully integrated with range tracking and data systems and provides 150 nmi² of coverage over the instrumented range, sufficient to test any systems within the coverage of high-accuracy in-air and in-water tracking.

The following charts summarize our versatile range operations in 2002.



AUTECH continues to provide range support to allied nations such as Canada and the United Kingdom for Test and Evaluation events through the U.S. Navy's Foreign Military Sales (FMS) program.

For a look at what's on the horizon, see the Upcoming Capabilities section.

Several new customer tests and exercise types were hosted this year. Our range was selected by Space and Naval Warfare Command (SPAWAR) as the site to investigate the Navy's future acquisition of an anti-jam global positioning system (GPS) Antenna System (GAS-1) for surface ships expected to operate near or in littoral waters. This effort provided an opportunity to collaborate with the Bahamian Government, the Federal Aviation Administrations of Miami and New York, and the U.S. Coast Guard.

The U.S. Department of Defense (DoD) Counter-Drug Technology Development Program Office (CDTDPO) conducted Transportable High Frequency Surface Wave Radar T&E exercises in June 2002. The international program's goal is to develop cost-effective and continuous surveillance of small maritime vessels and low-flying aircraft along coastal regions. This program was a collaborative effort between Defence Research and Development Canada, AUTECH, and Raytheon.

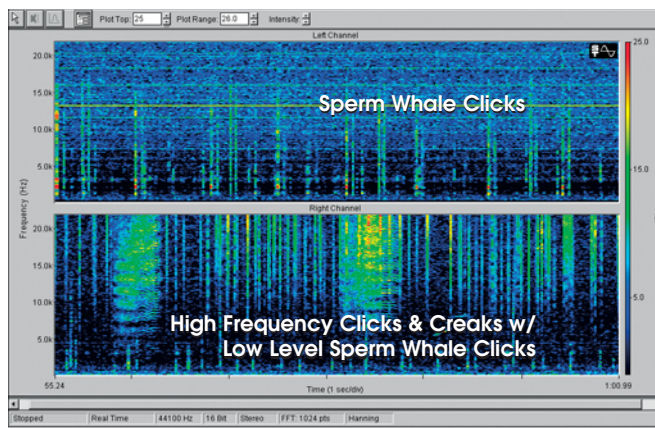
Other customers hosted in 2002 included Stanford University, University of Miami, the National Aeronautics and Space Administration (NASA), and SERDP. AUTECH installed neutrino study equipment for Stanford University to remotely gather data using AUTECH's assets to test the hypothesis that outer-space-based tau-neutrinos can be acoustically detected in low ambient noise waters. The University of Miami performed optical acoustics T&E. NASA launched weather balloons above Andros Island to collect vertical profiles of pressure, temperature, relative humidity, wind, and the derivatives of these measurements, all of which are useful for enhancing the prediction of hurricane movement. SERDP Project CS-1188, entitled Acoustic Response and Detection of Marine Mammals, used an Advanced Digital Acoustic Recording Tag developed by the Woods Hole Oceanographic Institute. The tag monitored beaked, pilot, and sperm whales. Concurrent with the data recorded from tags, AUTECH monitored the movement of these whales in the water columns using bottom-mounted hydrophones.

Goal 4: Improve Productivity and Performance ⇒ Versatile Tasking and Efficiency

To reduce operating costs and increase value to range users, three information (technology) systems were implemented during 2002. These efforts are part of a five-year business resource strategic plan, initiated in 2000, which will integrate all the discrete AUTECH business and administrative data systems required to run our small city.

First, to operate more efficiently, Commercial off-the-shelf COTS barcode inventory software was installed for property control and federal supply functions. Second, VAX legacy technology was upgraded to PC-Windows-based, client-server COTS system (GOLD version 6.8.5).

Third, through the effort of several teams, new range water space management software was developed and implemented to integrate and combine test activities. Data such as range customer scheduling, labor resource assignment, range asset allocation, and vehicle water space commitment can be browsed by range and test planners.



Beginning in 2002, our team focused on an integrated financial, human resources, and materials management environment. A COTS browser-based system was chosen to automate workflows, procurement approval processing, on-line time sheet reporting and processing, user-driven budget and labor data reporting, and provide essential business information to approved managers at their desktop.

Goal 5: Nurture a High-Performance Workforce ⇒ Increase Retention/Maintain Experience

To improve living conditions on Andros Island, we continue pursuing two Military Construction (MILCON) requests, Project P-200 would replace our Bachelor Enlisted Quarters (BEQ), and Project H-1-01 would build 35 family housing units. Part of this process involved hosting visits by representatives from the Naval Sea Systems Command Quality of Life (QOL) Office, and NAVFAC Engineering Field Division, Charleston, to review AUTECH's Family Housing Program.

Our Dependent Education Team implemented programs and training in response to concerns identified in parent-school surveys, including accelerated reading software and classroom guidance training for teachers. AUTECH continuously seeks parental feedback on school programs. This year's survey results reflect a 97.5% favorable response.

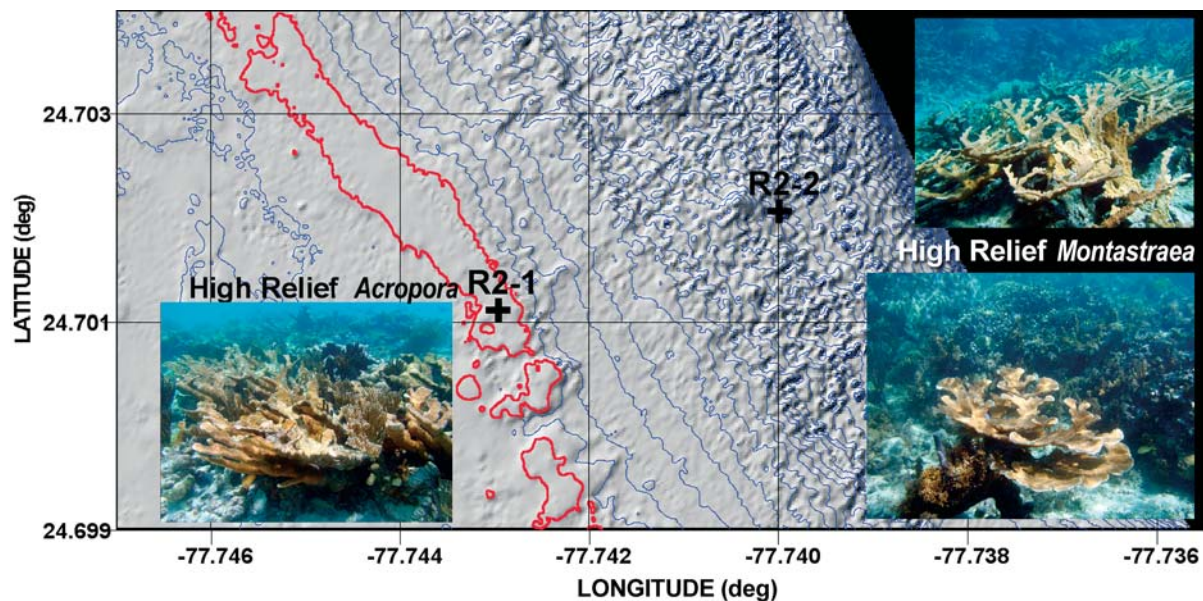
Goal 6: Improve Regulatory Compliance ⇒ Safeguard Personnel and Our Habitat

As a result of a CNO-N34 Post Validation Report, AUTC immediately added Navy Force Protection personnel at Andros Island and will continue to add personnel through 2005 in accordance with appropriate Force Protection conditions.

In anticipation of future environmental DoD requirements, AUTC's Environmental Team developed a baseline reef assessment methodology

using high-resolution imagery data obtained from the IKONOS satellite and Light Detection and Ranging (LIDAR) data to support the DoD's Coral Reef Protection and Implementation Plan. Analysis of these data allows for the determination of the presence of reef structure in and around the AUTC facility. Prior methods assessed less than 0.008% of the reef, were more costly, and feedback often took years.

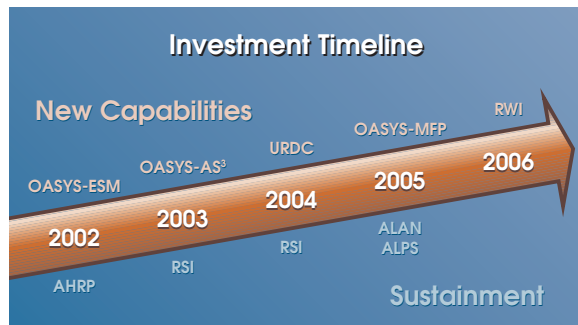
Our Environmental Team also established an Operational Tracking Program and Database Archiving System which takes a proactive approach



to probable DoD requirements. The system records test operations, date of review, environmental compliance approval identification (test association number) and reviewer's electronic signature. A munitions tracking program and database were developed as well to accurately track expenditures that occur on the AUTC Deep Water and Berry Island ranges. Expenditures from operations are tracked by date, type, AUTC test number, user organization, quantity, and range location, and then summarized by month and year.

AUTC had the good fortune this year to see and document rare sea and wildlife. During range operations divers sighted and recorded the movements of a live oarfish in May 2002. More details can be viewed by visiting NUWC's website: <http://www.npt.nuwc.navy.mil> under Public Affairs Office, Public Releases.

Upcoming Capabilities



Two programs will provide our military customers with the ability to conduct integrated test and evaluation of undersea warfare combat and sensor systems in a dynamic multi-mission environment by shifting to "network-centric" paradigms such as Off-board Advanced System Stimulation (OASYS) and Underwater Range Data Communications (URDC).

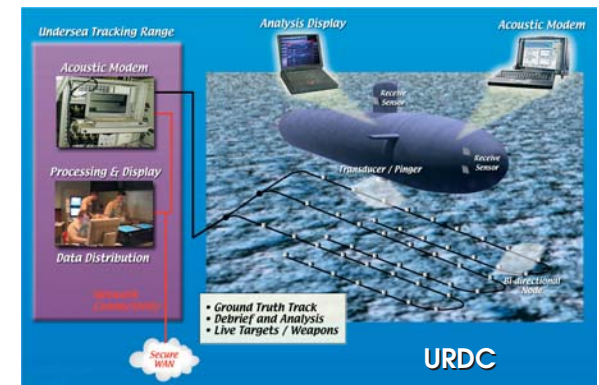
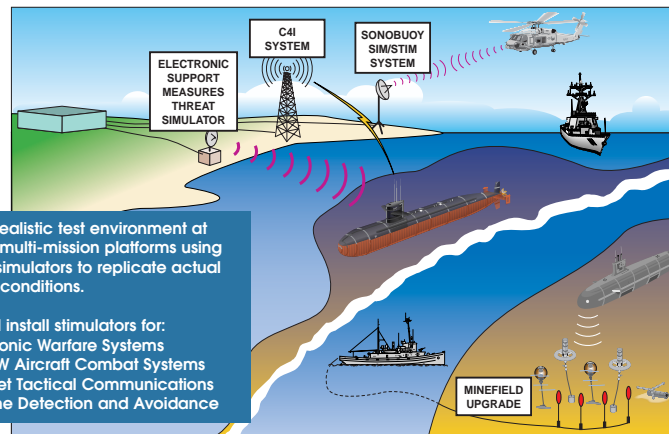
The second phase of the OASYS program has resulted in the installation of the Aircraft Sonobuoy Simulation/ Stimulation System (AS3). The AS3 system uses a dynamic acoustic signature simulation and acoustic propagation modeling, coupled with a multi-channel sonobuoy transmitter to create a realistic operating environment for ASW aircraft without deploying actual sonobuoys. In 2003, Fleet tactical data link simulation and testing will be achievable at AUTC and

2005 will see the installation of an upgrade to AUTC's Berry Island minefield to enable feedback on mine detection and avoidance.

The URDC program will provide digital communications between submerged submarines and a shore-based communications center at AUTC.

To sustain current capabilities, the RangeWare Improvement (RWI) Program will replace all outdated computer hardware and software that provides AUTC's primary ranges' real-time and post-test data collection, reduction, and production. RWI software will be object-oriented and hardware platform-independent, enabling efficient configuration management and ease of enhancement (operational 2005/2006).

OASYS Concept



These programs will enable AUTC to support T&E of the Navy's future USW-capable platforms, including the Virginia Class submarine, SH-60R Multi-Mission helicopters, Maritime Multi-mission aircraft, as well as block improvements to existing platforms.

Funds are expected for two Improvement and Modernization projects submitted in 2001 for the Program Objective Memorandum of 2004. The AUTC Local Area Network (ALAN) upgrade and AUTC Lightning Protection System (ALPS) upgrade are proposed for completion in 2006. ALAN will provide connectivity to all Andros Main Base buildings and replace outdated equipment. ALPS will upgrade the current system to sustain range availability in a lightning-prone environment.

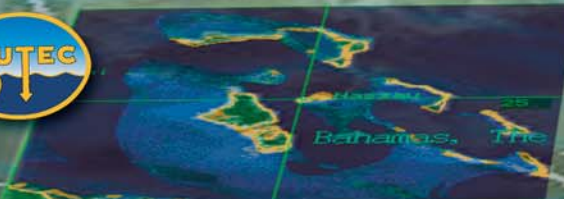
For more information visit our website <http://www.npt.nuwc.nav.mil/AUTC>.

Acronym List

AHRP	AUTEC Hydrophone Replacement Program	NASA	National Aeronautics and Space Administration
ALAN	AUTEC Local Area Network	NATO	North Atlantic Treaty Organization
ALPS	AUTEC Lightning Protection System	NAVFAC	Naval Facilities Engineering Command
AS3	Aircraft Sonobuoy Simulation/Stimulation	NFA	NATO FORACS AUTEC
AUTEC	Atlantic Undersea Test and Evaluation Center	NMI	Nautical Mile
BARTS	Buoyed Acoustic Range Tracking System	NSWC	Naval Surface Warfare Center
BEQ	Bachelor Enlisted Quarters	NUWCDIVNPT	Naval Undersea Warfare Center Division Newport
BOQ	Bachelor Officer Quarters	OASYS	Off-board Advanced System Stimulation
CDTDPO	Counter-Drug Technology Development Program Office	PTS	Portable Tracking System
CNO	Chief of Naval Operations	QOL	Quality of Life
COTS	Commercial Off-The-Shelf	RDT&E	Research, Development, Test, and Evaluation
DAH	Data Acquisition Hours	RSE	Range Systems Engineering (Raytheon)
DoD	Department of Defense	RWI	RangeWare Improvement
ESM	Electronic (Warfare) Support Measures	SCA	Student Conservation Association
FMS	Foreign Military Sales	SERDP	Strategic Environmental Research and Development Program
FORACS	Naval Forces Sensor and Weapons Accuracy Check Site (for NATO program)	SPAWAR	Space and Naval Warfare Command
GAS	Global Positioning System Antenna System	T&E	Test and Evaluation
GPS	Global Positioning System	TOTO	Tongue of the Ocean
GSA	General Services Administration	TRS	Training Resource Strategy
LIDAR	Light Detection and Ranging	U.K.	United Kingdom
MILCON	Military Construction	URDC	Underwater Range Data Communications
MRTFB	Major Range and Test Facility Base	USCG	United States Coast Guard
		WPB	West Palm Beach



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